

CLAIMS

What is claimed is:

1. A duplex electro-photographic developing machine, comprising:
  - a printing medium tray loading a printing medium;
  - a tray open/closed detecting unit detecting whether the printing medium tray has been opened and closed;
  - a transferring roller transferring a toner image onto the printing medium;
  - a resistance measuring unit measuring a resistance value of the printing medium passing the transferring roller; and
  - a concentration controlling unit controlling a concentration of the toner image transferred to the printing medium according to the measured resistance value,

wherein the concentration controlling unit controls the concentration of the toner image according to the resistance value measured by the resistance measuring unit in response to the printing medium tray having changed from an open state to a closed state.
2. The developing machine of claim 1, further comprising a fixing roller, wherein the resistance value of the printing medium is measured as the printing medium moves between the fixing roller and the transferring roller.
3. The developing machine of claim 2, wherein the resistance measuring unit measures the resistance value by comparing a first resistance of the transferring roller and the fixing roller without the printing medium therebetween with a second resistance of the transferring roller and the fixing roller with the printing medium therebetween.
4. The developing machine of claim 1, wherein the printing medium of the measured resistance value is transferred to a duplex printing path in response to the printing medium tray changing from an open state to a closed state.
5. The developing machine of claim 4, further comprising a power supply detecting unit detecting whether power is supplied to the duplex electro-photographic developing machine, wherein the concentration controlling unit controls the concentration of the toner image according to the resistance value measured by the resistance measuring unit when the detected power changes from an off-state to an on-state.

6. The developing machine of claim 5, further comprising:  
a photosensitive body; and  
a toner image forming unit forming the toner image on the photosensitive body;  
wherein the concentration controlling unit controls the concentration of the toner image  
formed by the toner image forming unit.

7. The developing machine of claim 6, further comprising a high voltage power  
supplier supplying a high voltage to the transferring roller, wherein the concentration controlling  
unit controls the concentration of the toner image transferred to the printing medium by  
changing the high voltage supplied by the high voltage power supplier.

8. The developing machine of claim 7, wherein the transferring roller further  
comprises a metal shaft, and the high voltage power supplier is coupled to the metal shaft of the  
transferring roller.

9. The developing machine of claim 8, further comprising a sensing resistor,  
wherein the sensing resistor is coupled to the high voltage power supplier to detect a transfer  
current supplied to the transferring roller.

10. The developing machine of claim 9, further comprising an amplifier amplifying the  
detected transfer current.

11. The developing machine of claim 10, further comprising an A/D converter  
converting the amplified current into a digital value.

12. The developing machine of claim 11, wherein the resistance measuring unit  
measures the resistance value of the printing medium based on the digital value.

13. The developing machine of claim 7, wherein the concentration controlling unit  
controls the high voltage power supplier so that the toner image is transferred by a preset high  
voltage in response to the toner image being transferred to another surface of the printing  
medium.

14. The developing machine of claim 7, wherein the concentration controlling unit retrieves a stored look-up table, and controls the high voltage supplied by the high voltage power supplier according to a result in the stored look-up table that corresponds to the measured resistance value of the printing medium.

15. The developing machine of claim 1, further comprising a plurality of printing medium trays, wherein there are a plural number of the tray open/closed detecting units respectively provided to each of the plurality of printing medium trays.

16. The developing machine of claim 1, wherein a signal from the tray open/closed detecting unit is transmitted each time an electro-photographic developing order is received.

17. The developing machine of claim 1, wherein a signal from the tray open/closed detecting unit is transmitted periodically at a predetermined time period.

18. A method of controlling a concentration of a toner image of a duplex electro-photographic developing machine, comprising:

detecting whether a printing medium tray, with a printing medium being loaded therein, has been opened and closed;

measuring a resistance value of the printing medium passing a transferring roller; and controlling the concentration of the toner image transferred to the printing medium according to the measured resistance value of the printing medium,

wherein the resistance value of the printing medium is measured in response to the printing medium tray changing from an open state to a closed state.

19. The method of claim 18, further comprising transferring the printing medium of the measured resistance value to a duplex printing path in response to the printing medium tray changing from the open state to the closed state.

20. The method of claim 19, further comprising detecting whether power is supplied to the duplex electro-photographic developing machine, wherein the concentration of the toner image is controlled according to the resistance value measured in response to the power supplying state changing from an off-state to an on-state.

21. The method of claim 20, further comprising forming the toner image on a photosensitive body, wherein the concentration of the toner image is controlled according to the measured resistance value of the printing medium.
22. The method of claim 21, wherein the concentration of the toner image transferred to the printing medium is controlled by changing the voltage supplied to the transferring roller.
23. The method of claim 22, wherein the toner image is transferred by a preset voltage in response to the toner image being transferred to another surface of the printing medium.
24. The method of claim 23, wherein the toner image is transferred by the preset voltage in response to the toner image being transferred to the continuously supplied printing medium after the printing medium tray is closed.
25. The method of claim 22, wherein the voltage supplied to the transferring roller is determined according to a result in a stored look-up table that corresponds to the measured resistance value of the printing medium.
26. An electro-photographic developing machine, comprising:
  - a printing medium tray;
  - a tray open/closed detecting unit detecting whether the printing medium tray has been opened and closed; and
  - a controlling unit;wherein the controlling unit determines a resistance value of a printing medium in response to the tray having been opened and closed, and controls a concentration of toner image applied to the printing medium according to the resistance value.
27. The electro-photographic developing machine of claim 26, further comprising:
  - a power supply detecting unit detecting whether the power supply stopped and restarted;wherein the controlling unit determines the resistance value of the printing medium in response to the power supply having been stopped and restarted, and controls the concentration of toner image applied to the printing medium according to the resistance value.

28. A machine readable storage medium controlling an electro-photographic printer, wherein the controlling comprises:

determining whether a printing medium tray has been opened and closed;

determining a resistance value of a printing medium in response to the tray having been opened and closed; and

controlling a concentration of toner image applied to the printing medium according to the resistance value.

29. The machine readable storage medium of claim 28, wherein the controlling further comprises:

determining whether a power supply to the electro-photographic printer has been stopped and restarted;

determining the resistance value of the printing medium in response to the power supply having been stopped and restarted;

and controlling the concentration of toner image applied to the printing medium according to the resistance value.